March 26, 1963 C. F. HICKS 3,082,946

BELT COMPUTER WITH MANUALLY ADJUSTABLE TENSIONING MEMBER

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FIG. 1

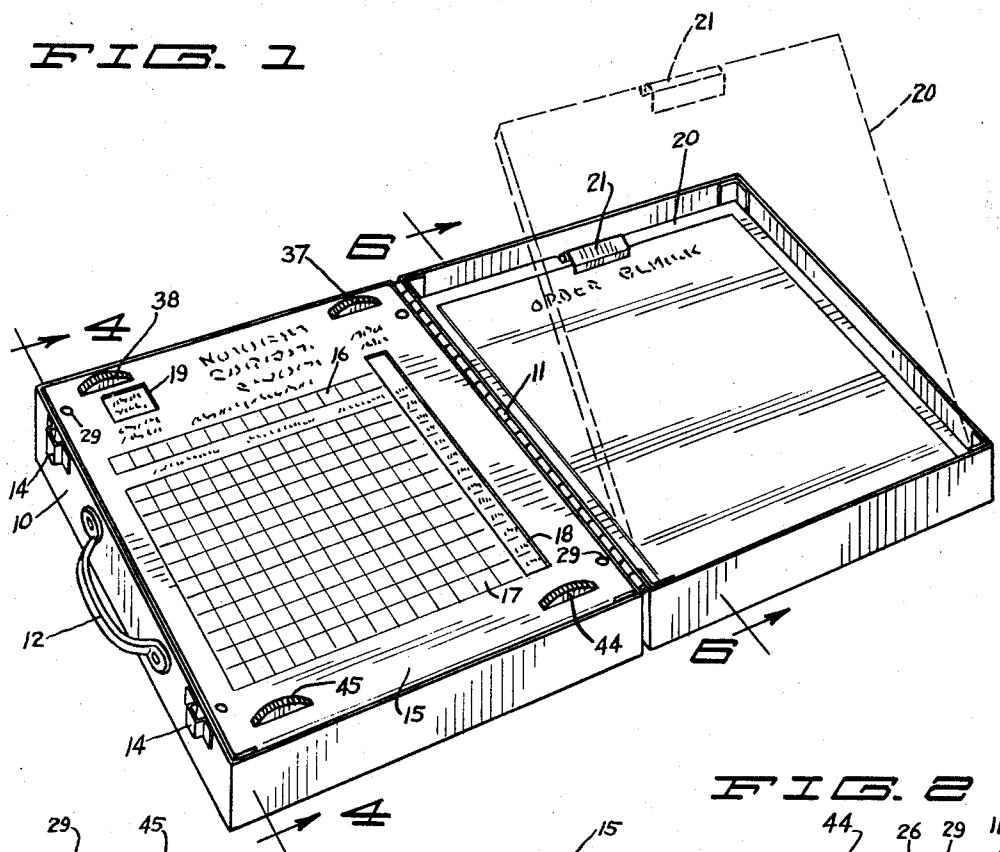
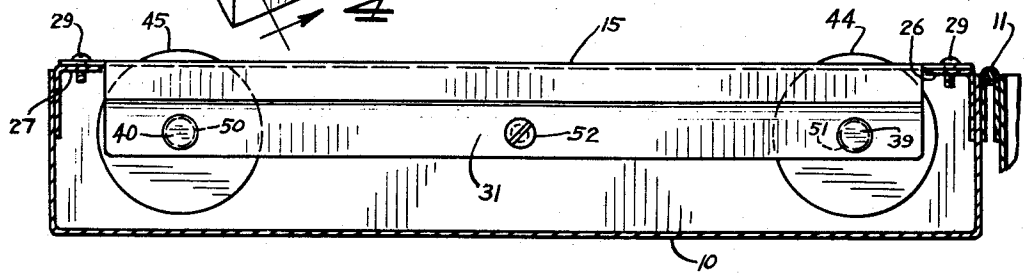


FIG. 2



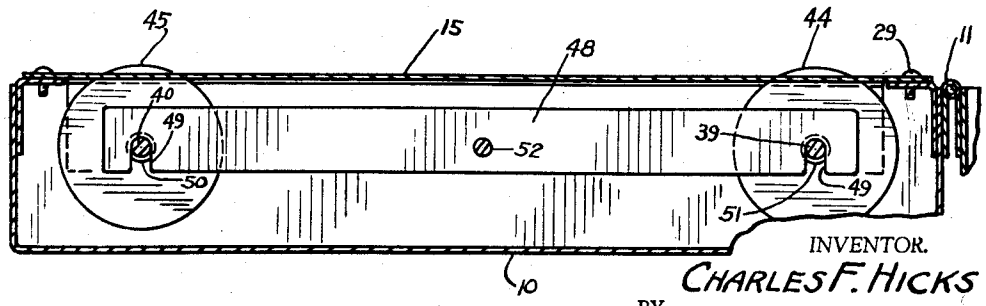


FIG. 3

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FIG. 6

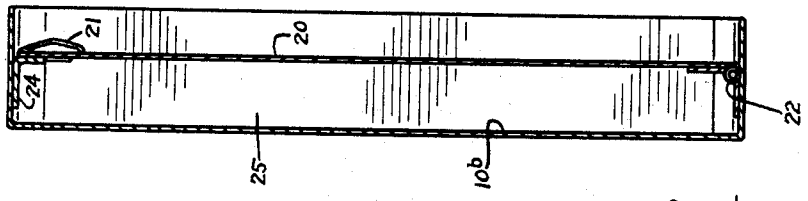


FIG. 4

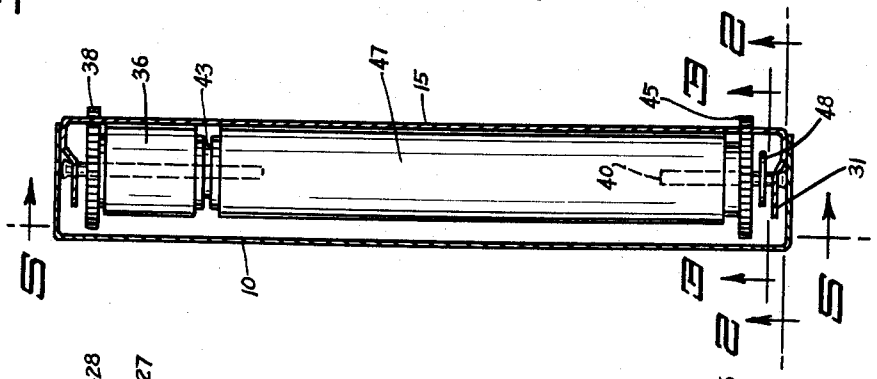
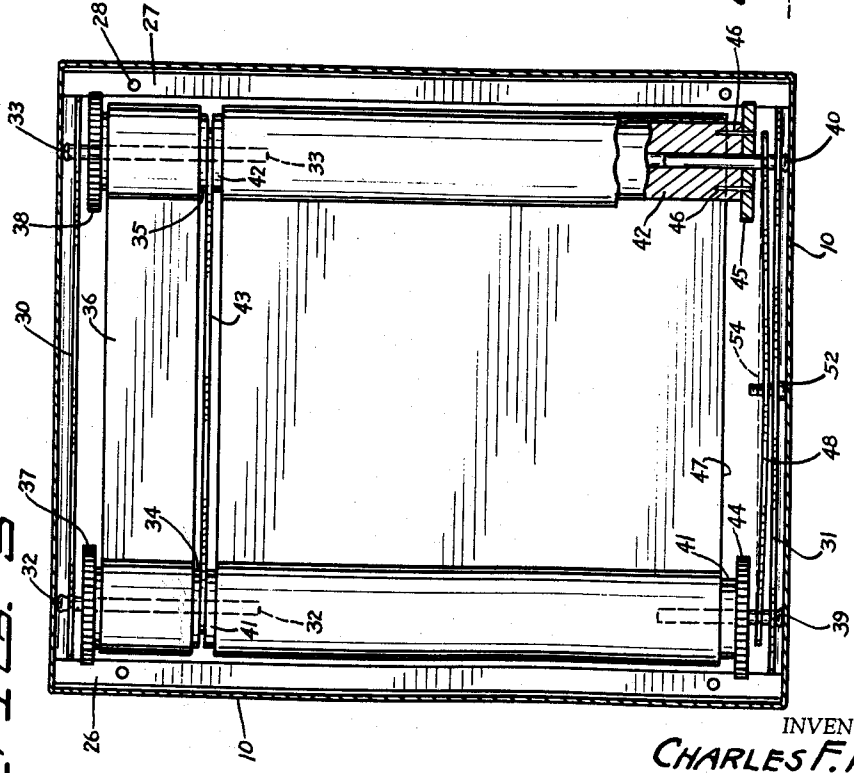


FIG. 5



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BELT COMPUTER WITH MANUALLY ADJUSTABLE TENSIONING MEMBER

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3 Claims. (Cl. 235—86)

This invention is a device for computing amounts of additives to be combined with given materials to produce a desired result. Specifically, this device computes the amount of concentrate to be added to grains in order to produce an end product having a desired percentage of protein. The structure of this computer is novel, among other reasons, in using a bar for maintaining tension on the rollers thereof that carry belts on which certain of the information is recorded. Novelty also resides in the axle structure by means of which the rollers are secured to the frame of the device. Other novel features include the location of the belt viewing windows relative to each other and the arrangement of charts of information on the face of the machine relative to the indicia on at least one of the belts.

Accordingly, it is an object of this invention to provide a computer device by means of which a vast amount of information may be presented in a relatively small space.

It is another object of this invention to provide a computer device on which information is stored on belts rolled on rollers and which may be presented to windows in the face of the device by means of knobs or discs, the rate of rotation of which is controlled.

A still further object of this invention is to provide a computer device in which the shaft of at least some of the rollers have notches therein which are engaged by a tension member, the tension of which may be altered.

It is yet another object of this invention to provide a computer device in which pairs of rollers are supported on stub axles that are journalled in the frame only at one end of each roller.

Yet another object of this invention is to provide a computing device as a sales aid in which space is provided for all materials necessary for making computations and recording sales.

Other and further objects of the invention are those inherent and apparent in the apparatus as described, pictured and claimed.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

The invention will be described with reference to the drawings in which corresponding numerals refer to the same parts and in which:

FIGURE 1 is a perspective view of the device ready for use and with broken lines showing an adjusted position of parts;

FIGURE 2 is an enlarged fragmentary sectional view taken on the line 2—2 of FIGURE 4;

FIGURE 3 is a view similar to FIGURE 2, drawn to the same scale and taken on the line 3—3 of FIGURE 4;

FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 1 and drawn to a scale between that used in FIGURES 1 and 2; broken lines illustrate hidden parts;

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 4, and drawn to the same scale as that figure; broken lines illustrate hidden parts; a portion of the device is broken away to illustrate construction fully; and

FIGURE 6 is a sectional view taken on the line 6—6 of FIGURE 1 and drawn to the same scale as FIGURES 4 and 5.

FIGURE 1 shows the computer housed in a container having some depth and here illustrated as the carrying case **10** divided into two parts which are connected by the piano hinge **11**. A suitable handle as at **12** may also be provided for ease in carrying. Suitable catches, portions of which appear at **14** in FIGURE 1, allow the carrying case to be secured in a closed condition when transported.

The left hand compartment of case **10**, as shown in FIGURE 1, is provided with the computer unit itself. A face plate **15** is provided with one or more tables, here shown as the two tables **16** and **17**, on which data that will be employed in each computation appears. At the right of tables **16** and **17** appears the window **18**. Through this window, additional indicia may be brought into view. Another window **19** in the upper left hand corner of face plate **15** is similarly provided with indicia that may be brought into view at will.

The right hand compartment of case **10** is provided with a writing support or board **20** which has a spring clip **21** thereon by means of which materials may be held on the board **20**. Board **20** is hinged to the case **10** so that it may be raised into the position illustrated in broken lines in FIGURE 1. This hinge may be seen at **22** in FIGURE 6. As is also clearly shown in FIGURE 6, the hinge is substantially above the bottom **10***b* of the right hand compartment of case **10**. A stop member **24** engages the board **20** at its end spaced from the hinge **22** and holds the board substantially above the bottom **10***b*. This provides a storage space **25** below board **20** into which materials may be placed that are used only intermittently or as a reservoir and storage place for materials clipped to board **20** at times.

Turning now to FIGURE 5, case **10** will be seen to be provided with the mounting flanges **26** and **27**, having appropriate holes as indicated at **28** to receive fastening devices. Referring again briefly to FIGURE 1, the face plate **15** will be seen to have the heads **29** of fastening devices showing thereon, which fastening devices engage the holes **28** and the mounting flanges **26** and **27** to secure face plate **15** in case **10**.

Case **10** is also provided with two of bearing flanges **30** and **31** respectively. Bearing flange **30** supports one end of the axles **32** and **33**. Each of these axles engages rotatably one of the cylindrical rollers **34** and **35** to which the ends of an information carrying band **36** are secured.

Also secured to the rollers **34** and **35** are the serrated wheels **37** and **38** respectively. These serrated wheels extend through the face of face plate **15** at appropriate slots and provide a means for rotating the rollers **35** and **36** from the top of face plate **15**. Because FIGURE 5 is taken from the bottom, the position of rollers and controls **37** and **38** appear to be reversed in FIGURE 1 as compared to their position in FIGURE 5. By an appropriate manipulation of wheels **37** and **38**, any of the material recorded on band **36** may be brought into view in window **19**.

The bearing flange **31** provides support for one end of the axles **39** and **40**. Axles **32** and **33** extend entirely through rollers **34** and **35** and also engage rollers **41** and **42**. All of the rollers rotate freely with respect to the axles and a washer plate **43** extends between adjacent ends of aligned rollers. Consequently, rotation of rollers **34** and **35** is not communicated to the rollers **41** and **42** and vice versa.

As in the case of wheels **37** and **38**, however, the control wheels **44** and **45** are secured to the rollers **41** and **42** in a suitable manner and illustrated with respect to control disc **45** and roller **42** as being the pins **46**. Similar means may be employed with each control wheel as its associated roller.

Some means of maintaining a slight tension on the rollers **41** and **42** is provided in order to assure that belt **47** (comparable to belt **36** for rollers **34** and **35**) will be kept tight. Holding belt **47** tight causes immediate movement of band **47** whenever discs **44** and **45** are manipulated.

A very satisfactory means is illustrated in FIGURES 3 and 5 as being a flexible slightly springy bar **48** which has notches in it as at **49**. The axles **39** and **40** are provided with grooves as at **50** and **51**, for the two axles respectively, which grooves receive the edges of notches **49**. Conversely stated, the notches **49** of bar **48** slidably fit into the grooves **50** and **51**. Notches **49** of bar **48** are spaced approximately the same distance as the axles **39** and **40**, hence the band drops easily onto the axles when it is in a straight condition.

An adjusting means such as screw **52** extends through an appropriate opening in bearing flange **32** and engages threadably the center of band **48** as seen in FIGURES 3 and 5. When screw **52** is tightened, as it has been to some extent in FIGURE 5, bar **48** is deflected toward bearing flange **32** as shown by the solid lines in that drawing. The broken line **54** represents the undeflected position of band **48**.

It is thought that either or both of two actions occur when the screw **52** is thus tightened. In the first place, the bending of the band tends to move the notches **49** closer together, thus giving a slight cant to the axles **39** and **40**. Also, as band **48** is somewhat springy by nature, it tends to push the ends of axles **39** and **40** against the inside of case **10** when the unit is assembled, thus providing additional friction if the axles try to rotate with the rollers. The screw **52** is tightened only sufficiently to provide tension necessary for the rollers to hold band **47** taut when it is being moved by one or the other of the control knobs **44** and **45**. By using the two control knobs alternately, any of the various indicia printed on band **47** may be brought into view in window **18**.

A structure similar to band **48** may be applied to the rollers **35** and **36**, but experience has shown that adequate friction is provided for these smaller rollers by merely having the ends of axles **32** and **33** bear on the inside of case **10** as shown in FIGURE 5.

The information on band **34** and which appears in window **19** as the result of the manipulation of knobs **37** and **38** is basic information as to the requirements necessary for a given situation. It does not have to align with the material recorded on tables **16** and **17**. As an example, band **34** can be provided with the percentages of protein required in feed for various kinds, ages, weights or activities of livestock. Pullets up to a certain age may require a given percentage of protein as indicated by present studies, whereas at a different stage in their growth they may require a different percentage of protein. Layers may require a still different protein percentage. Sows in gestation and hogs being prepared for market will have substantially different protein requirements as may working or loafing boars.

Material on band **47**, however, is used only in conjunction with the tables **16** and **17**. In the example used by way of illustration, the table **16** sets out the amount of protein concentrate to be added to a given amount of grain to produce a given percentage of protein. Table **17** shows a large variety of different quantities that may be related to any of the different grains listed on band **47** and with which the portein additive will be combined. Band **47** also lists a series of different percentages aligning with the horizontal columns in table **17**. Once the information in window **19** is known, the wheels **44** and **45** are adjusted to show at the top of window **18** the grains and type of additive to be used in the mix. A percentage of protein nearest to that shown in window **19** as the amount required is then found by proceeding vertically down the information visible in window **18**. By then tracing across at this horizontal level on table **17** until a quantity equal to the amount of basic grain to be used is found, the amount of additives is easily determined by tracing vertically up that column to the information recorded in table **16**.

Window **19** may be positioned remotely from window **18** since there is no need for a particular physical relationship between the information indicated in the two windows. Thus, face panel **15** may be stamped more readily than would be the case if it were necessary to have the windows **18** and **19** closely adjacent to each other. Furthermore, since the information recorded in any vertical column on band **47** may be applied to several of the situations recorded on band **34** and appearing in window **19**, a tremendous amount of information may be provided in a relatively confined space. For example, a single customer of a grinding mill may want corn prepared for feeding to both friers and layers. The information with one setting at window **18** may well be adequate for both, and it is only necessary to alter the information appearing in window **19** in order to determine the percentage of protein required and proceed with the calculations.

Although this device was evolved to calculate the amount of feed concentrate to add to grains for a particular feeding problem, the structure may well be applied to other calculating situations. Window **19** might show the capacity of the cooling system of various automobiles, for example, and band **47** carry information as to bands of antifreeze and a range of temperatures. Chart **17** would show the cooling capacities of all cars in table form and **16** the quantity of anti-freeze necessary to protect to the selected temperature.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

What is claimed is:

1. A computer device comprising a frame, said frame having a face plate, flanges depending from said face plate, two rollers aligned between said flanges, a stub shaft extending through one of said flanges and into one of said rollers, a stub shaft extending through the other of said flanges, entirely through the other of said rollers and into the other end of said first mentioned roller, a second pair of stub shafts and rollers like said first pair of stub shafts and rollers and spaced therefrom radially, bands longer than the distance between said radially spaced rollers, each of said bands having one end secured to one of said rollers, windows in said face plate opposite a portion of each band, means for turning each of said rollers independently, corresponding ones of said stub shafts being grooved, a bar having notches therein spaced like said corresponding stub shafts and engaging said grooves, and means for bending said bar comprising a screw extending through one of said flanges and threadably engaging said bar.

2. A computer having a box-like frame divided into approximately equal halves and hinged together, a panel hinged below the open edges of one-half of said frame, a stop means on a wall opposed from said panel hinge spaced below the open edges of said one-half of said frame, clip means secured to said panel, flanges secured to the inside of the other half of said frame and spaced downward from its upper edge slightly, a face plate secured to said flanges, bearing flanges extending downward at the ends of said face plate, a set of rollers made up of a short roller and a long roller positioned in

substantial alignment between said bearing flanges at one side of said face plate, a stub shaft extending through one of said bearing flanges and into one end of the longer of said rollers, a stub shaft extending through the other of said bearing flanges, entirely through the shorter of said rollers and into the end of the longer of said rollers, disc means larger than said rollers secured to the ends thereof and extending through slots in said face plate to be accessible above said face plate, a second set of rollers like said set of rollers spaced radially therefrom along the opposite side of said other frame half, a washer bar extending between the adjacent ends of both of said sets of rollers and embracing both of said stub shafts that extend entirely through said shorter rollers, flexible bands substantially longer than the space between said sets of rollers, each band having its ends secured to corresponding rollers of opposed sets of rollers, windows in said face plate extending the width of said

bands, horizontal columns of indicia recorded on said face plate and aligning with columns of indicia appearing in at least one of said windows on the band associated with two of said rollers, portions of each of said horizontal columns of indicia also being aligned vertically and aligning vertically with a separate series of indicia giving the desired end results.

3. The computer of claim 2 in which two of said stub shafts are grooved, a notched bar extends between and embraces with its notches, the grooves of said two stub shafts, and screw threaded means extending through one of said flanges and engaging threadably said bar.

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